this class of inquiries, and who discusses them in a way and style equally interesting and instructive to the professional naturalist or physiologist, and to the general reader. To the intelligent agriculturist and breeder, these volumes will be especially valuable, and it is in the interest of such practical men and amateurs that they are here reprinted."

COSMOS. (Weekly) Paris.—This journal, besides giving weekly reports of the proceedings of the French Academy, has a most useful summary of news in all departments of physical and natural science, including rural economy and the application of chemistry to the arts. During the past year it has published, in weekly parts, "The Comparative Geology of Meteorites," by M. Stanislas Meunier, son of M. Victor Meunier, the Editor in chief. The leading article of the present number (dated March 21, 1868) is on the general method of the immediate analysis of meteoric stones, by M. Stanislas Meunier, which is succeeded by an account of M. M. E. Fremy and Terreil's general method of the immediate analysis of vegetable tissues.

M. T. Reiset writes on the ravages of the Cockchafer, or "Hanneton" (*Melolontha vulgaris*), and its larva, the beetle of which in the spring of 1865 defoliated the oaks and other trees, while immense numbers of their larvæ in the succeeding year, 1866, devoured to a fearful extent the roots of garden vegetables, etc., at a loss to the department of the Lower Seine of over five millions of dollars. This insect is three years in arriving at its perfect beetle state. The larvæ hatched from eggs laid by the beetles which appeared in such numbers in 1865, passed a second winter, that of 1867, at a mean depth in the soil of $\frac{40}{100}$ of a metre, or nearly a foot and a half. The thermometer placed in the ground (which was covered with snow) at this mean depth, never rose to the zero point* as *minimum*. Thus the larvæ survived, after being perfectly frozen (probably most subterranean larvæ are thus frozen, and thaw out in the spring at the approach of warm weather). In June, 1867, the grubs having become full-fed, made their way upwards to a mean distance of about thirteen inches below the surface, where, in less than two months, they all changed to the pupa state, and in October and November the perfect beetle appeared. The beetles, however, hybernate, remaining below the surface for a period of five or six months, and appearing in April and May. The immature larvæ, warned by the approaching cold, began to migrate deep down in the soil in October, when the temperature of the earth was ten degrees above zero. As soon as the snow melted they gradually rose towards the surface. They began to rise February 23, 1867, when the temperature of the earth had risen a little, being + 7°. 1, the mean temperature of the soil in January being + 2°. 8.

QUARTERLY JOURNAL OF SCIENCE. (London.) In the April number Mr. John Mayer writes on the claims of Nitro-glycerine as an industrial agent. It has been used as a blasting material in the operations of mining, quarrying, and railway cutting for about three years. He con-

*By the Centigrade thermometer.

siders it as in reality "less dangerous than gun-cotton, gunpowder, and more completely under control than they are." "Weight for weight the new explosive is ten times more powerful than gunpowder. The extraordinary mechanical or eruptive power which it exerts is partly owing to the fact that there is no solid residue attending the explosion, and that the enormous pressure exerted by the resulting gases is due to the great rapidity of the explosions." In blasting, hard tamping is of little use, owing to its curious property of "striking down," *i. e.* exerting its explosive force almost entirely in a downward direction.—Mr. C. F. Danvers writes an interesting article on Ransom's Patent Concrete Stone. This very durable building material is made by mixing "sand, chalk, or other mineral substance with its proper proportion of a solution of silicate of soda in an ordinary pug-mill, and the mixture, which very much resembles in substance fresh putty rolled in sand, and is of a very plastic consistence, is either pressed into blocks or moulds, or can be rolled into slabs or such forms as may be desired, and is afterwards either saturated with, or immersed in, a solution of chloride of calcium, when a double decomposition of the two solutions employed immediately takes place. The silica combines with the calcium, and at once forms an insoluble silicate of lime, firmly binding together all the particles of which the stone is composed, whilst at the same time the chlorine combines with the soda and forms chloride of sodium, or common salt, which is easily removed."—Prof. G. Zaddach gives a very thorough account of Amber. It is found on the shore of the Baltic, principally at Samland, where there are "in deep-seated deposits an inexhaustible store of this valuable fossil." Amber is the gum or liquid resin of a pine tree of Eocene Tertiary age, and occurs in rolled fragments, very seldom weighing as much as half a pound, in the form of pins, drops, and plates, which were formed between the bark and the wood, or between the yearly rings of growth of the stem, and were washed from the low boggy coast into the sea, in which the crabs, sea-urchins, and oysters, associated with it, lived, the deposits in which they are now found having been formed at the mouth of a stream. With the Amber-pine flourished Camphor trees, Willows, Birches, Beeches, and numerous Oaks; and amongst the Conifers was a *Thuja*, very similar to the *Thuja occidentalis*, or White Cedar, now living in this country, "next to which abounded *Widdringtonia*, Pines, and Firs in great variety. Many thousands of the first might already have perished, and, while the wood decayed, the resin, with which the stems and branches were stored, might have accumulated in large quantities in bogs and lakes in the soil of the forest. In order to explain, however, that this accumulation of Amber could be suddenly broken up, floated away, and scattered, I assume that the coast of the district was at that time on the point of sinking." Amber is torn up from its bed by storms and thrown upon the shore, "where a hundred hands are waiting to intercept it with nets;" or "the inhabitants of the coast go in boats, and, turning the stones [between which the larger pieces are

found] with hooks fastened on long poles, endeavor to discover the Amber in the interspaces, and to draw it up with small nets." This is called "striking for amber." Like the gum copal of Africa, amber is of interest to the entomologist from the insect remains it contains, some of which are figured in the second plate (from specimens selected by Mr. F. Smith, from the British Museum) accompanying the article, the first plate being a geological map with sections of the localities of Amber.—The gigantic Dragon-tree of Teneriffe is no more. Its age was estimated to be over 6000 years old.—M. Balsamo has obtained hybrids between the American and the Italian Cotton plants. He hopes to obtain a plant of the long staple form of our species (Gossypium Barbadense) which shall ripen earlier in Italy than it now does. He has also investigated the action of light on the germination of seeds. "He found by using a glass jar full of vegetable mould, that seeds exposed to the action of sunlight were greatly retarded in, if not entirely prevented from, germination. Seeds to which only yellow light had access were not affected.—Frau Lüders believes that she has proved (what many fungologists were prepared for), that *Vibriones* are produced from the spores and germinal filaments of various moulds or fungi. Vibriones were supposed to be infusoria. The learned lady believes that the blood of living animals contains *Vibriones*, but during life they are quiescent, showing no signs of life until putrescence commences. Professor Hallier, the best authority on fungi, but who does not accept Frau Lüders' results as to the connection of "moulds" and "vibriones," announces "that he has been able to isolate and identify from the blood of typhus fever patients a distinct form of fungus; also in vaccine matter and in other cases. Dr. Salisbury, of New York, has also recently made known the observation of distinct fungi in the fluids of persons suffering from other contagious diseases. Are we not advancing to a great fact as to the nature of such diseases? Fermentation and vaccination may come to mean much the same thing. Frau Lüders has also successfully shown that "yeast" may be grown from many "moulds," as first demonstrated by Hallier.—Dr. O. Fraas believes that there were formerly glaciers on Mount Sinai.—Dr. Collingwood has discovered on the shore of the China Sea an enormous blue Sea-anemone, two feet in diameter, in which little fishes take shelter. A small fish is known to inhabit the body-cavity of Holothurians, or Sea-cucumber, and also of Jelly-fishes.—Mr. Shirley Hibbard believes the culture of the Ailanthus Silk-worm in Great Britain to be a delusion. The thread is too short. An acre under culture yielded about ten shillings, and another year eight pounds, while the same space planted with potatoes yields twenty pounds; and frosts carry off the insects. The cocoons "are least in value of any silk-worm's cocoon, and are in fact almost rubbish."—Professor Kölliker has lately made the discovery of true polymorphism among coral animals (Anthozoa). Besides the usual form of sea-pens (*Virgularia* and *Pennatula*) is another, destitute of tentacles, besides other important anatomical differences.—The bodies of

various Molluscs are found to contain acids, enabling them to bore in rocks. Pholas is known to bore into gneiss (stratified granite). Two boring worms, *Leucodore* and *Sabella*, which bore cavities in limestone rocks, also contain acid. — Mr. Flower thinks there is but one species of Sperm Whale.

NATURAL HISTORY MISCELLANY.

BOTANY.

THE LONG MOSS OF THE SOUTH (*Tillandsia usneoides*). — In a recent number of the NATURALIST Dr. Asa Gray inquires whether this is really an Epiphyte, and gives some reasons for a suspicion it may probably be a parasite. Several times I have had fresh specimens, and fastened them on blocks, — dead blocks of course, — just as we do with Epiphytæ, Orchidæa, and had them grow as healthily as in their natural state. One I left in the Orchidæa house, at Springbrook, near Philadelphia, some years ago, had then been eighteen months on the block, and I believe was amongst the lot sold at public sale two years afterwards. Many Tillandsias, and allied genera, grow nearly as well on blocks in Orchidæa houses, as in the earth. — THOMAS MEEHAN.

In the hope of throwing some light on the question raised by Professor Gray, in the February number of the NATURALIST, I offer the following facts, which fall under my daily observation, attempting, however, no explanation.

1. The Long Moss, or Spanish Moss (*Tillandsia usneoides*), grows abundantly and luxuriantly on the dead branches of our live-oaks, and other trees, but when these dead branches fall to the ground, it soon dies.

2. On a tree near my house, which has been entirely dead for more than a year, there is a thrifty growth of this moss.

3. I often find it simply hanging by a loop to a twig, or a projecting point of bark, and still growing vigorously.

4. On fallen trees, even on those recently cut down, I find it generally, but not always, withered and dead. — D. H. JACQUES, *Glen Evergreen, Jacksonville, Fla.*

LONG OR BLACK MOSS (*Tillandsia usneoides*) ONLY AN EPIPHYTE. — Concurrent testimony from several quarters makes it clear that *Tillandsia* does not perish on cutting down the tree that supports it, and that it thrives as well on dead as on living trees. Our original informant must therefore have been mistaken. — A. GRAY.

ANOMALOUS FLOWERS OF THE WILLOW. — There is a species of Willow (*Salix*) growing near here which has for two seasons borne the above